

Serial No.: 10/723,031  
Amdt. dated 05 December 2006  
Reply to Office Action of 05 July 2006

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### REMARKS

As noted previously, the Applicant appreciates the Examiner's thorough examination of the subject application and requests reconsideration and further examination in light of the foregoing amendments and the following remarks.

Claims 1-6 and 8-10 are pending in the subject application. Claim 7 was canceled previously. Claims 1, 9, and 10 have been amended herein. Claims 11 and 12 are new and include subject matter formerly included in claims 9 and 10, respectively. No new matter has been added.

In the *final* Office Action mailed 05 July 2006, claims 1-6 and 8-10 were rejected on various statutory grounds, described in further detail below.

#### ***Claim Rejections – 35 U.S.C. § 102***

Concerning items 1-2 of the Office Action, claims 1-6 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,328,365 to Jacoby ("Jacoby"). Applicant respectfully traverses the rejection and requests reconsideration for the following reasons.

For a rejection under 35 U.S.C. § 102(b), the cited reference must teach each and every element as arranged in the claim(s) at issue. In this situation, Jacoby fails to teach each and every limitation as arranged in claim 1.

Amended claim 1 recites: A dental instrument comprising:

- (a) a hollow shank having, a rearward fitting, and a forward head including a contact region and a window in proximity thereto;
- (b) said contact region being adapted for cutting, scraping, and/or grinding dental tissue;

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(c) a source of laser energy in the low infrared spectrum approximately from 600 nm to 1100 nm, wherein the source is configured and arranged to produce laser energy for photodamage or photothermal effect to destroy residual bacteria;

(d) said window being transmissive with respect to said laser energy; and

(e) a fiber optic bundle extending from said source of laser energy, through said fitting and said shank for communication with said window; wherein said dental instrument is configured and arranged to enable a dental professional to subject a surgical site simultaneously to (1) cutting, scraping and/or grinding, and to (2) said laser energy for photodamage or photothermal effect to destroy residual bacteria.

[Emphasis added]

In contrast, Jacoby is directed to endoscopic viewing apparatus that do not utilize infrared light to destroy bacteria:

The present invention overcomes some or all of the shortcomings of the prior art by providing an endoscopic viewing apparatus device which is insertable into the subgingival sulcus or periodontal pocket to enable the operator to view the subgingival tissues and/or tooth surfaces, without the need for surgical excision or cutting of the gingiva. The apparatus of the present invention is useable to visually guide, monitor and/or assess various subgingival treatment or surgical procedures including, but not limited to, procedures for treatments for removing deposited material (e.g., plaque, calculus) from subgingival tooth surfaces.

(Jacoby, col. 5, line 61 to col. 6, line 5) [Emphasis added]

While Jacoby mentions utilization of certain lasers for the illumination of a subgingival sulcus or periodontal pocket, such lasers are disclosed as only illumination sources for imaging the "subgingival sulcus or periodontal pocket to enable the operator to view the subgingival tissues and/or tooth surfaces, without the need for surgical excision or cutting of the gingival". Jacoby, col. 5, lines 61-65. Jacoby does not teach the use light to counter (by either photo damage or photothermal damage) the effects of bacteria and thus does not teach all elements of independent claim 1.

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Jacoby is thus an improper basis for a rejection of claim 1 under 35 U.S.C. § 102(b), and claim 1 is therefore patentable over Jacoby. Because claims 2-6 depend from claim 1, they are patentable for at least the same reason. Applicant respectfully requests that the rejection of claims 1-6 over Jacoby be removed.

Concerning item 3 of the Office Action, claims 1-6 and 9 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,090,908 to Teumim-Stone ("Teumim-Stone"). Applicant respectfully traverse the rejection and requests reconsideration for the following reasons.

For a rejection under 35 U.S.C. § 102(b), the cited reference must teach each and every element as arranged in the claim(s) at issue. In this situation, Teumim-Stone fails to teach each and every limitation as arranged in independent claims 1 and 9 as amended. Claim 1 is set forth above and in the preceding listing of claims. Amended claim 9 recites a process claim analogous to claim 1.

In contrast with claims independent claims 1 and 9 of the subject application, Teumim-Stone teaches an improvement to a laser apparatus for periodontal treatment in which the apparatus includes a surgical laser operating to cut tissue (*see, e.g.*, Teumim-Stone, col. 5, lines 47-48), a handpiece, and directing means wherein the improvement includes a protective shield at the end of the handpiece. *See, e.g.*, Teumim-Stone, col. 2, lines 28-42.

The Teumim-Stone reference does not teach or suggest use of a dental instrument for both (i) cutting, scraping and/or grinding, and (ii) applying infrared laser energy to destroy bacteria, *e.g.*, a dental instrument that is "configured and arranged to enable a dental professional to subject a surgical site simultaneously to (1) cutting, scraping and/or grinding, and to (2) said laser energy for photodamage or photothermal effect to destroy residual bacteria," as recited in claim 1.

Thus, Teumim-Stone is an improper basis for a rejection of claims 1 and 9 under 35 U.S.C. § 102(b), and claims 1 and 9 are therefore patentable over Jacoby. Because claims 2-6

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depend from claim 1, they are patentable for at least the same reason. Applicant respectfully requests that the rejection of claims 1-6 and 9 over Teumim-Stone be removed accordingly.

### ***Claim Rejections – 35 U.S.C. § 103***

Concerning items 4-5 of the Office Action, claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Jacoby in view of U.S. Patent Publication No. US2003/0059379 to Andersen et al. ("Andersen"). Applicant respectfully traverses the rejection and requests reconsideration for the following reasons.

One requirement for a rejection under 35 U.S.C. § 103(a) is that the cited reference(s) teach or suggest each and every limitation of the claim(s) at issue. A further requirement for a rejection under 35 U.S.C. § 103(a) is that proper motivation must exist to combine the teachings of the cited references. For the rejection of claim 8, these requirements are not met, and thus the rejection is improper.

Regarding the first noted requirement of teaching each and every element in the claim(s) at issue, Jacoby and its deficiencies regarding claim 1 are discussed previously. Andersen is directed to use of staining dye systems applied to targeted tissue in conjunction with laser irradiation for the treatment of periodontal disease. Andersen does not teach any structure that is inserted in or adjacent to a periodontal pocket beyond that of a tip of fiber optic element, e.g., fiber tip 80 of Fig. 2, and thus fails to cure the noted deficiencies of Jacoby.

Regarding ostensible motivation to combine the teachings of Andersen and Jacoby, it is respectfully submitted that the Examiner may have used impermissible hindsight analysis in making the rejection as neither of the cited references teaches or suggests the specific wavelengths claimed in claim 8. The cited Andersen reference teaches use of a laser in combination with a dye applied to diseased tissue, such as that found for periodontal disease. As for use of a laser, Andersen teaches that such is a "laser that outputs one or more wavelengths absorbed by the dye system." Andersen, paragraph [0014]. Specific examples and embodiments described in Andersen are directed to dye lasers (referring to the laser active medium) operating

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in the red to orange portion of the visible spectrum and argon gas lasers operating in the blue-green region of the visible light spectrum. *See, e.g.*, Andersen, paragraph [0015].

As the specification of the subject application explains, use of 870 nm and 930 nm wavelengths (as claimed in claim 8) provides a criticality that:

allows the operator to turn down the power and increase the exposure time in the area of treatment with the laser on, to gain bacterial death. That is a dual wavelength (870 nm and 930 nm) diode laser. This laser is designed to kill bacteria with a photodamage instead of a photothermal effect. This occurs because the wavelengths (870 nm and 930 nm) are not transparent to the bacteria and react with one or more bacterial intra-cellular chromophores or pigments to damage the bacterial cell and induce death. This laser, when coupled to a periodontal scaler, does not require ICG [Indocyanine Green] to expand its therapeutic window, as it is already selectively targeting bacterial chromophores, and kills the bacteria by photodamage long before photothermolysis takes place.

(paragraph [0039])

While the Examiner is correct that Andersen mentions IR lasers that emit in the region of 800-980 nm, Andersen fails to appreciate the criticality of the specific wavelengths recited in claim 8. Regarding use of a laser, Andersen also teaches the following:

In general, at least a portion of the laser energy utilized within the inventive methods disclosed herein will include light having a wavelength in a range of about 450 nm to about 600 nm, more preferably in a range of about 460 nm to about 550 nm, and most preferably in a range of about 480 nm to about 520 nm. The most preferred wavelengths (i.e., about 480 nm to about 520 nm) are in the blue to blue-green color range.

(Andersen, paragraph [0028]) [Emphasis added]

Applicants note that Andersen teaches that any use of an IR laser operating in an IR region is supplemental to use of laser energy in the regions from about 450 nm to about 600 nm. *See*, Andersen, paragraph [0029]: "In addition to the use of laser energy in a range of about 450 nm to about 600 nm, it is within the scope of the invention to utilize laser energy in the IR regions as a supplemental source of laser energy." Thus, Andersen does not teach or suggest the

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usefulness or desirability of the specific wavelengths recited in claim 8 (i.e., 870 nm and 930 nm), as one of skill in the art would appreciate when reading Andersen. Applicants further note that Andersen fails to teach any dyes that absorb at 870 nm and/or 930 nm, and thus Andersen would not provide motivation to use the wavelengths of claim 8.

Thus, the combination of the teachings of Jacoby and Andersen fails to arrive at the system recited in claim 8. Consequently, Jacoby and Andersen are an improper basis for a rejection of claims 8 under 35 U.S.C. § 103(a), and the rejection of claim 8 should be removed.

Concerning item 6 of the Office Action, claims 8 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Teumim-Stone in view of Andersen. Applicants traverse the rejection and request reconsideration for the following reasons. As noted previously, for a rejection under 35 U.S.C. § 103(a) the references must teach or suggest each and every limitation of the claims and issue; further, proper motivation must exist to combine the teachings of the cited references. These requirements are not met the rejection of claims 8 and 10.

Claim 8 is discussed above. Claim 10 as amended is similar to amended claim 9, discussed above. The Teumim-Stone reference, discussed previously, only describes use of a CO<sub>2</sub> laser or a Nd-YAG (Neodymium-dope Yttrium Aluminum Garnet) laser, which lases do not operate at the wavelengths recited in claims 8 and 10. As the Examiner correctly recognizes, Teumim-Stone does not teach or suggest use of a laser operating at the wavelengths of 870 nm and 930 nm. As noted above, Andersen fails to teach or suggest use of the 870 nm and 930 nm wavelengths. For at least this reason, the combination of the Teumim-Stone and Andersen references is an improper basis for a rejection of claims 8 and 10 under 35 U.S.C. § 103(a). The rejection of claims 8 and 10 under 35 U.S.C. § 103(a) should be withdrawn accordingly.

### **Conclusion**

For the reasons stated above, the Applicant respectfully submits that all claims pending in the subject application are in condition for allowance and, further, requests that a Notice of Allowance be issued for the application.

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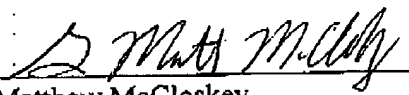
Authorization is hereby given to charge any fees that may be due, or credit any overpayment, to Deposit Account Number 50-1133. As noted previously, a Petition for an Extension of Time (2-months) under 37 C.F.R. § 1.136 and a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 are submitted with this paper.

The Examiner is invited to telephone the undersigned attorney to discuss any aspect of this application or this paper.

Respectfully submitted,

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